SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-45

Name: Waggoner Lake **County:** Haakon

Legal description: T 1N, R 20E Sec. 1 and T 1N, R 21E Sec. 6
Location from nearest town: 3 miles north of Philip, SD
Dates of present survey: July 16-18, 2012
Date last surveyed: July 6-8, 2010; September 30, 2010
Management classification: Warmwater permanent

Primary Species: (game and forage)	Secondary and other species:
1. Largemouth Bass	1. Black Crappie
2. Bluegill	2. Northern Pike
3.	3. Yellow Perch
4.	4. Green Sunfish
5.	5. Walleye
6.	6. Channel Catfish
7.	7. Smallmouth Bass
8.	8. White Sucker

PHYSICAL CHARACTERISTICS

Surface Area: 107 acres **Watershed:** 16,600 acres
Maximum depth: 21 feet **Mean depth:** 10 feet
Lake elevation at survey (from known benchmark): One foot below full-pool

Ownership of lake and adjacent lakeshore property:

The State of South Dakota has an easement for public access up to 12 feet above the high water mark. A majority of the lakeshore property is privately owned with small portions owned by the city of Philip and Haakon County.

Fishing Access

Waggoner Lake has boat access with a recently installed boat ramp and dock on the west shore. Shore access is limited to dam grade and swim beach areas during the summer as heavy vegetation around the shoreline makes shore angling difficult.

Observations of Water Quality and Aquatic Vegetation:

Emergent vegetation is limited to bulrushes and cattails, which are abundant in the bays and inlet areas of the lake. Submerged vegetation is a recurring problem in mid-summer and can greatly effect shoreline angling with more than fifty percent of the shoreline covered by submerged vegetation during summer. There is moderate siltation from run-off. Currently no pollution problems have been noted during fish surveys.

Observations on conditions of structures (i.e. spillway, boat ramps and docks, roads, etc)

A new boat ramp was installed in 2004 on the west side of the lake. In addition, a skid dock was constructed by the Rapid City Chapter of Walleyes Unlimited to allow boat users easier launching and loading of boats. The roads around the lake are in good condition but become soft after rain or snow events.

MANAGEMENT OBJECTIVES

Objective 1. Maintain a Largemouth Bass population with a minimum nighttime electrofishing CPUE for stock-length fish of 20/hour, PSD ranger greater than 50, and a PSD-P equal to or greater than 30.

Objective 2. Maintain balanced Black Crappie and Yellow Perch populations with PSD's ranging from 30 to 60.

Objective 3. Maintain a Bluegill population with catch of stock-length fish greater than 20, PSD of at least 20 and PSD-P of 5 or greater.

BIOLOGICAL DATA

Sampling Effort and Catch

A lake survey was conducted at Waggoner Lake on July 16-18, 2012. Sampling consisted of two experimental gill (gill) net (45.7 m [150 ft] long and 1.8 m [6 ft] deep with six 7.6 m [25 ft] panels of bar mesh sizes: 12.7 mm [0.5 in], 19.1 mm [0.75 in], mm [1.25 in], 38.1 mm [1.5 in], and 50.8 mm [2.0 in]) and eight modified fyke (trap) nets consisting of a 1.3 X 1.5 m frame, 19.1 mm (0.75 in) mesh and a 1.2 X 23 m (3.9 X 75.5 ft) lead (Figure 1). Fifty-five fish were captured in the gill nets and 1,113 fish were captured in trap nets (Tables 1 and 2). In trap nets, Black Crappies and Bluegills made up most of the catch at 53% and 40%, respectively. Discussion on selected fish species follows and completes this report.

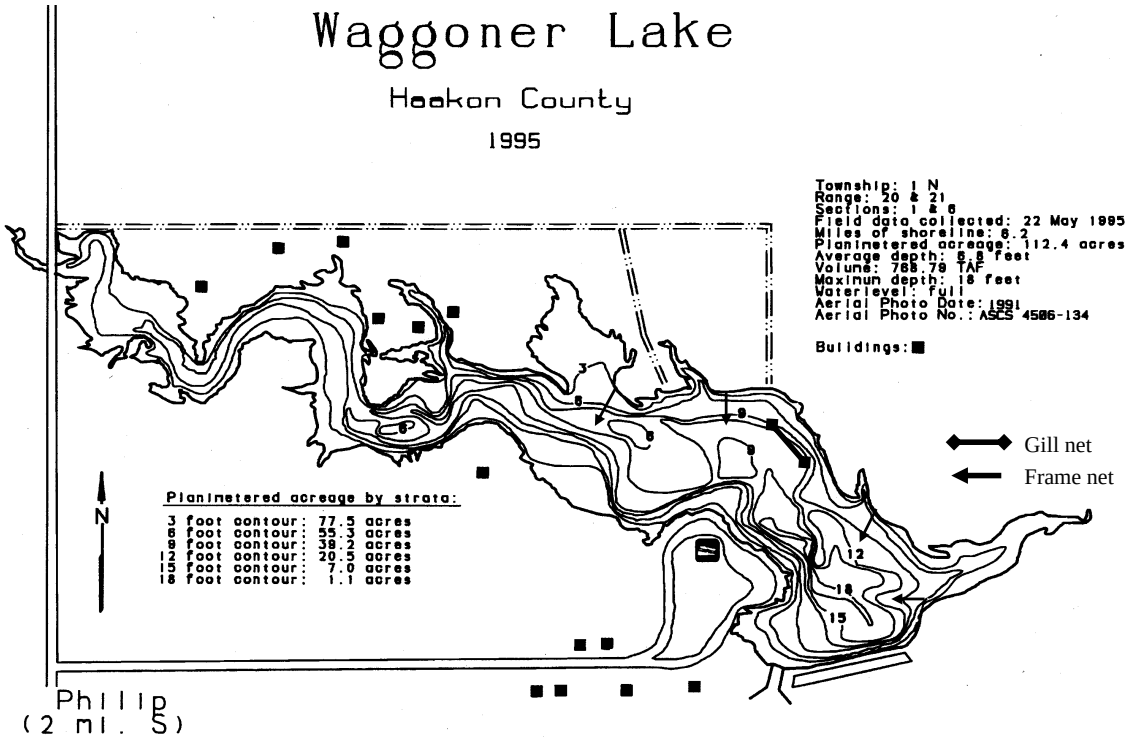

Figure 1. Locations of experimental gill (gill) and modified fyke (frame) nets used during the fiehry survey of Waggoner Lake, Haakon County, South Dakota, 2012.

Table 1. Species, number captured (N), catch per unit effort (CPUE), catch per net night of stock-length fish (CPUE-S), proportional stock density (PSD) and proportional stock density of preferred size fish (PSD-P) and relative weight of stock length and greater fish (*Wr*>S) from all species collected in experimental gill nets in Waggoner, Haakon County, South Dakota, July 16-18, 2012. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and *Wr* > S with 90% confidence intervals in parentheses.

Species	N	CPUE	CPUE-S	PSD	PSD-P	*Wr* > S
Black bullhead	9	4.5 (7.7)	4.5 (7.7)	89 (21)	89 (21)	105.6 (5.5)
Black crappie	8	4.0 (6.2)	4.0 (6.2)	13 (23)	0	103.0 (4.2)
Bluegill	3	1.5 (1.5)	1.5 (1.5)	--	--	100.9 (11.8)
Golden shiner	8	4.0 (12.3)	4.0 (12.3)	--	--	--
Northern pike	14	7.0 (9.2)	7.0 (9.2)	79 (21)	7 (13)	86.5 (4.2)
White Sucker	2	1.0 (3.1)	1.0 (3.1)	--	--	92.8 (10.1)
Yellow perch	11	5.5 (13.9)	5.5 (13.9)	64 (18)	27 (25)	94.5 (4.9)
Totals	55					

Table 2. Species, number captured (N catch per unit effort (CPUE), catch per net night of stock-length fish (CPUE-S), proportional stock density (PSD) and proportional stock density of preferred size fish (PSD-P) and relative weight of stock length or greater fish (*Wr*>S) from all species collected in modified fyke trap nets in Waggoner, Haakon County, South Dakota, July 16-18, 2012. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and *Wr*>S with 90% confidence intervals in parentheses.

Species	N	CPUE	CPUE-S	PSD	PSD-P	*Wr* > S
Black bullhead	5	0.6 (0.4)	0.6 (0.4)	100	60 (52)	99.1 (22.2)
Black crappie	594	74.3 (25.5)	74.3 (25.5)	51 (3)	0	102.4 (1.8)
Bluegill	449	56.1 (16.2)	56.1 (16.2)	92 (2)	4 (2)	109.0 (1.8)
Golden Shiner	3	0.4 (0.4)	--	--	--	--
Largemouth bass	7	0.9 (0.7)	0.9 (0.7)	71 (35)	57 (39)	104.3 (4.7)
Northern pike	40	5.0 (1.2)	5.0 (1.2)	55 (13)	30 (12)	77.0 (1.7)
White sucker	3	0.4 (0.4)	0.4 (0.4)	--	--	89.5 (10.6)
Yellow perch	12	1.5 (0.7)	1.5 (0.7)	75 (23)	25 (23)	96.7 (4.9)
Totals	1,113					

Black crappies

Black Crappie abundance was high, with a catch per unit effort (CPUE) of 74.3 (Table 2). Stock density indices met management objectives with a proportional stock density (PSD) of 51, which is an improvement from sizes in 2010 when PSD was 2. Mean relative weight of stock length and greater (*Wr*>S) Black Crappies was also greater with a value of 102.4 this year, compared to 97.5 in 2010. The high abundance and decent size structure should provide a quality fishery in the near future. Length frequency histograms indicate that most fish are between 190-200 mm (Figure 2).

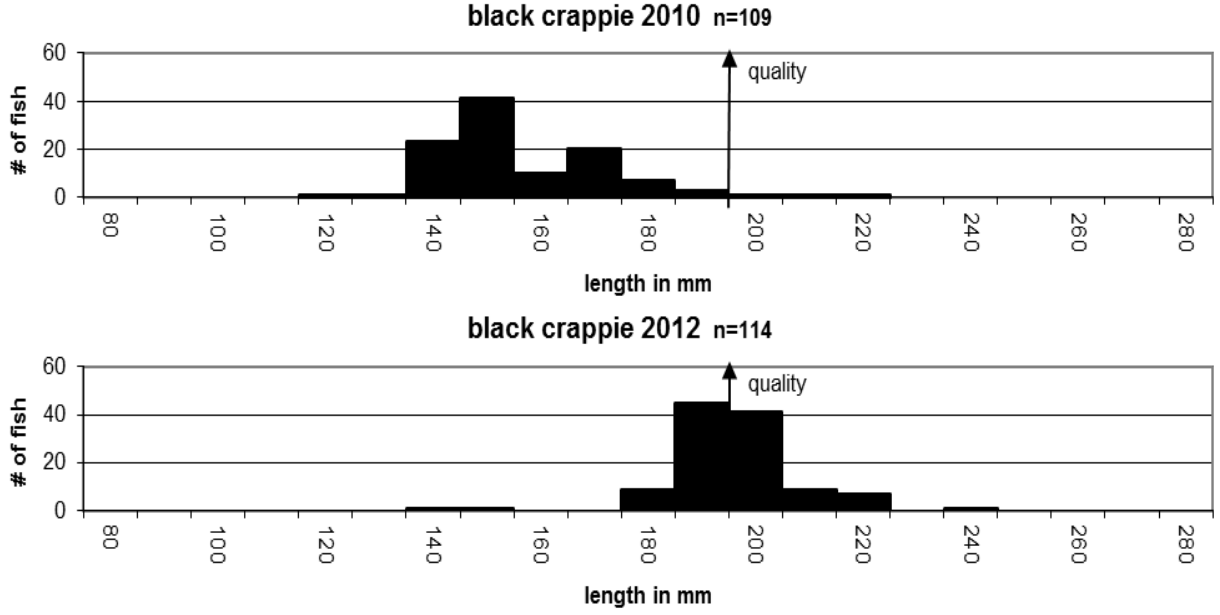

Figure 2. Length frequency histograms of Black Crappies collected in modified fyke nets from Waggoner Lake, Haakon County, South Dakota, 2010, 2012.

Bluegill

Bluegill were the second most abundant fish captured in trap nets in 2012 with a CPUE of 56.1 (Table 2). Sizes were excellent with a PSD of 92 and PSD-P of 4. In 2010, CPUE was lower at 16.9, with a PSD of 69 and a PSD-P of 0. Bluegill mean condition was high with a *Wr*>S of 109.0. These numbers are greater than or near the current management objective for Bluegill, which is stock length CPUE of 20, PSD between 20 and 60 and PSD-P 5 or greater. The length frequency histogram indicates the majority of the population between quality and preferred length (Figure 3).

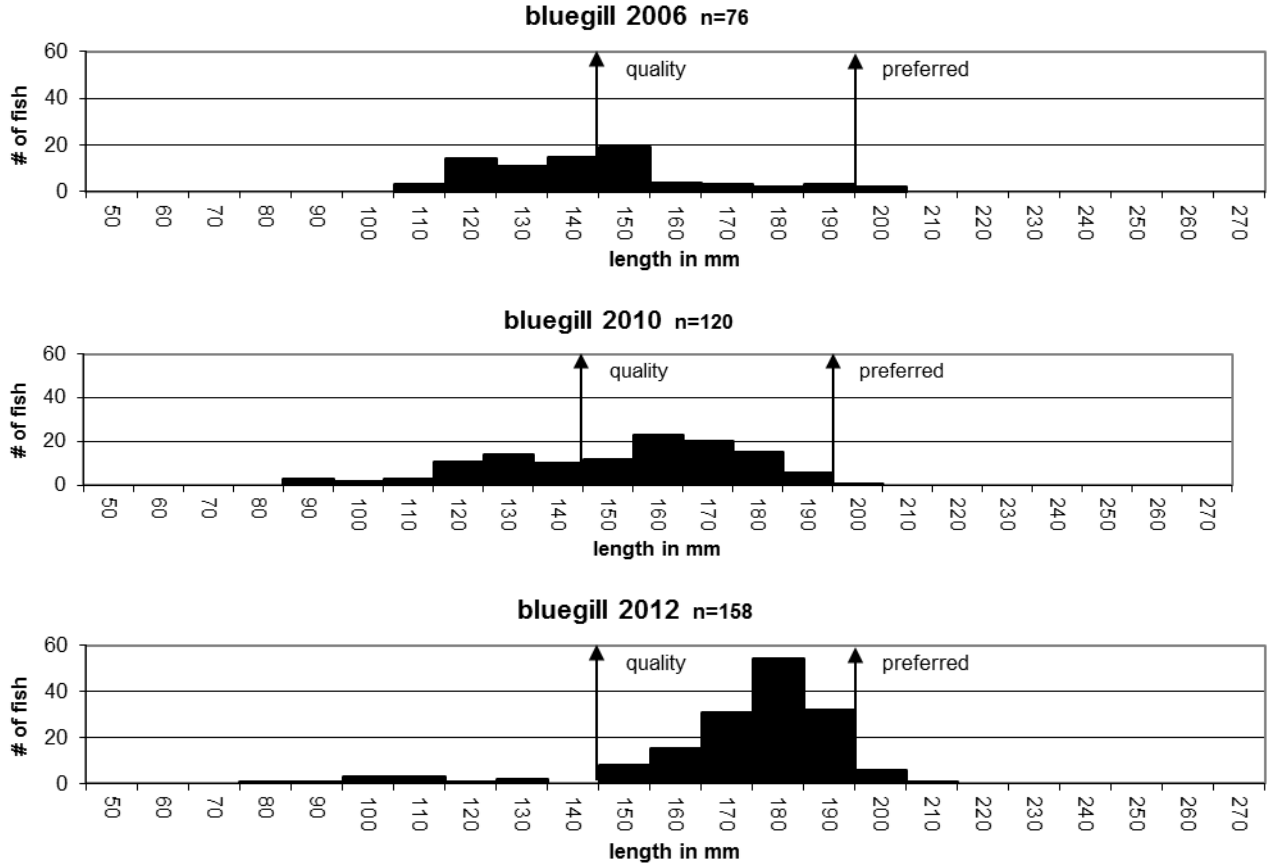

Figure 3. Length frequency histograms of Bluegill collected in modified fyke nets from Waggoner Lake, Haakon County, South Dakota, 2006, 2010, 2012.

Northern pike

Waggoner Lake appears to have a balanced Northern Pike population. Two gill nets caught 14 northern pike, and the eight trap nets sampled 40 more (Tables 1 and 2). In 2010, one gill net and three trap nets caught a total of 9 northern pike. Mean condition of northern pike was average with the gill net sample yielding a *Wr*>S of 86.5. Length frequency histograms of the

combined sample indicate a decent population with several year classes present, indicating good recruitment (Figure 4).

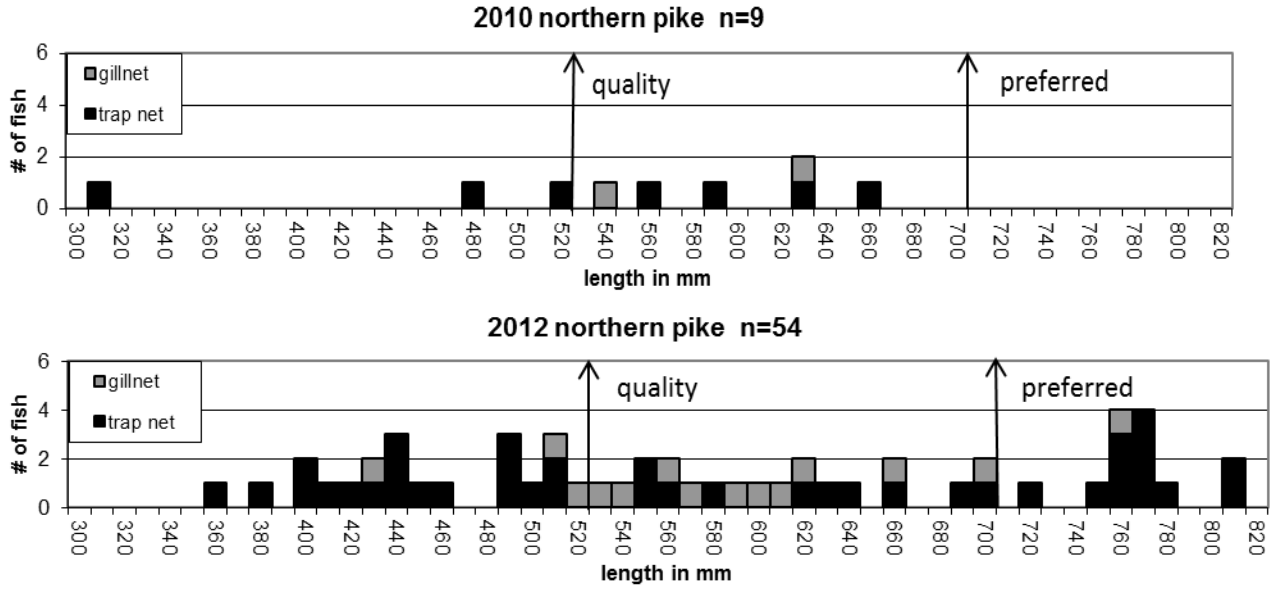

Figure 4. Length frequency histograms of Northern Pike collected in modified fyke (trap) and experimental gill (gill) nets from Waggoner Lake, Haakon County, South Dakota, 2010, 2012.

Yellow Perch

The Yellow Perch population appears to have decreased since 2010, when a total of 74 Yellow Perch were sampled from one gill net and three trap nets. In 2012, two gill nets caught 12, and our eight trap nets caught another 12 (Tables 1 and 2). The combined length frequency histogram indicates a low density population of various sized fish (Figure 5).

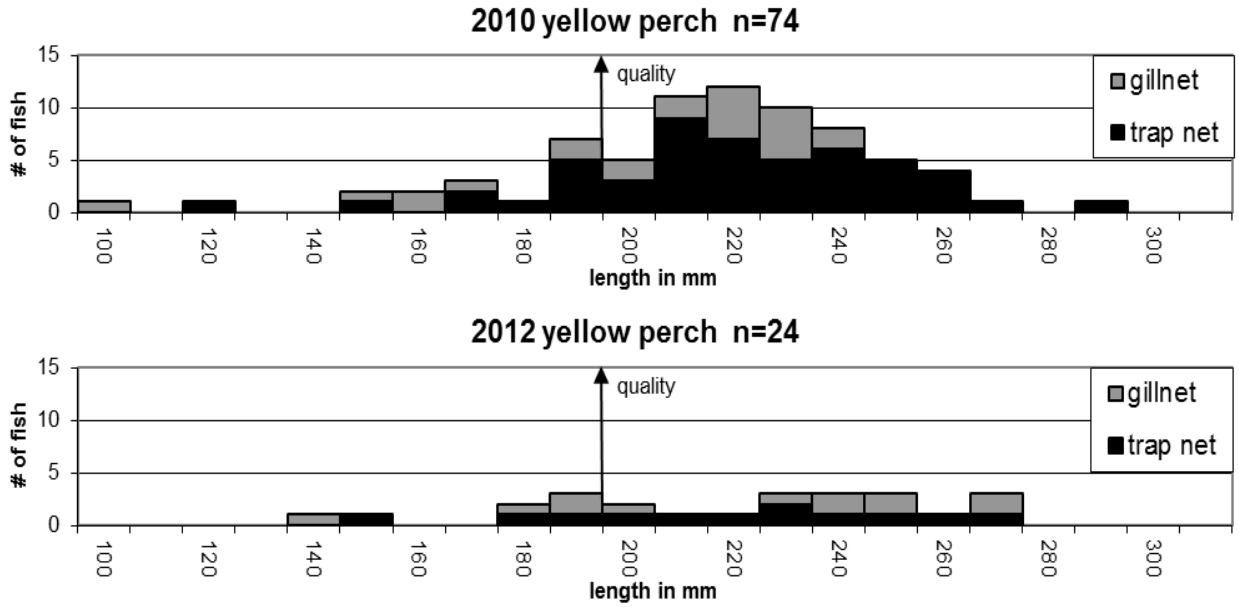

Figure 5. Length frequency histograms of Yellow Perch collected from experimental gill (gill) and modified fyke (trap) nets from Waggoner Lake, Haakon County, South Dakota, 2010, 2012.

RECOMMENDATIONS

1. Continue conducting fishery surveys once every 2 years to evaluate fish populations see if management objectives are being met.

2. Continue annual fall night electrofishing to develop long-term trend data of Largemouth Bass to help evaluate the protected length restriction.

APPENDIX

Appendix A. Year, number stocked, species and size of fish stocked into Waggoner Lake, Haakon County, South Dakota, 2000-2012.

Year	Number	Species	Size
2000	12,000	Largemouth bass	Fingerling
2001	905	Largemouth bass	Adults
	12,620	Largemouth bass	Fingerling
2002 – 2012		Not stocked	